Abstract

The present invention relates to two new wave field microscopes, type I and type II, which are distinguished by the fact that they each have an illumination and excitation system, which include at least one real and one virtual illumination source, and at least one objective lens (in the case of type II), i.e., two objective lenses (in the case of type I), with the illumination sources and objective lenses being so positioned with respect to one another that they are suited for generating one-, two-, and three-dimensional standing wave fields in the object space. The calibration method in accordance with the present invention is adapted to this wave field microscopy and permits geometric distance measurements between fluorochrome-labeled object structures, whose distance can be less than the width at half maximum intensity of the effective point spread function. The invention relates moreover to a method of wave-field microscopic DNA sequencing.